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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,957	09/04/2002	Christopher John Mazur	202-0235	7001
36865	7590	10/03/2005	EXAMINER	
ALLEMAN HALL MCCOY RUSSELL & TUTTLE, LLP			TRAN, DIEM T	
806 S.W. BROADWAY, SUITE 600			ART UNIT	
PORTLAND, OR 97205			PAPER NUMBER	
			3748	

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/064,957

Applicant(s)

MAZUR ET AL.

Examiner

Diem Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on amendment filed on 7/19/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-22 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 8-10 and 23 is/are rejected.
- 7) ☒ Claim(s) 3-5, 7 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This office action is in response to the amendment filed on 7/19/05. In this amendment, claims 1, 6, 18, 19, 23 have been amended. Overall, claims 1-23 are pending in this application.

#### *Specification*

The disclosure is objected to because of the following informalities:

-In the specification, page 1, line 4, the serial number of a related application should be inserted.

-In the specification, page 3, "preselcted" needs to be changed to --preselected--

Appropriate corrections are required.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Schafer-Sindlinger et al. (US Patent Application Publication 2002/0039550).***

Schafe-Sindlinger discloses a method for controlling reductant injection in an exhaust system of an engine having an upstream oxidation catalyst (1) and a downstream lean NOx catalyst (2) (see Figure 1), the method comprising:

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determining an amount of NO<sub>x</sub> exiting the upstream oxidation catalyst, calculating a ratio of NO to NO<sub>2</sub> contained in said amount of exiting NO<sub>x</sub> (see page 1, part [0010]); calculating an amount of reductant to be injected based on said second amount of NO<sub>x</sub> and said ratio (see Figures 4-6, page 3, parts [0035, 0043]); and controlling injected reductant based on said calculated amount of reductant to be injected.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claims 2, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schafer-Sindlinger et al. (US Patent Application Publication 2002/0039550).***

Regarding claim 2, Schafer-Sindlinger discloses all the claimed limitations as discussed in claim 1 above; however, fails to disclose using a NO<sub>x</sub> sensor to measure the NO<sub>x</sub> value downstream of said oxidation catalyst. Schafer-Sindlinger further discloses injecting NH<sub>3</sub> to the exhaust gas downstream of the oxidation catalyst in the molar ratio NH<sub>3</sub>/NO<sub>x</sub> of 0.6 to 1.6 (see page 3, part [0035]). Thus, an amount of NO<sub>x</sub> downstream of the oxidation catalyst in Schafer-Sindlinger is known by various means such as the use of a Nox sensor located downstream of the oxidation catalyst. Therefore, such disclosure by Schafer-Sindlinger is notoriously well known in the art so as to be proper for official notice.

Regarding claim 10, Schafer-Sindlinger discloses all the claimed limitations as discussed in claim 1 above; however, fails to disclose that said reductant system includes a control valve that receives a signal from said controller. Schafer-Sindlinger further discloses injecting  $\text{NH}_3$  to the exhaust gas downstream of the oxidation catalyst in the molar ratio  $\text{NH}_3/\text{NO}_x$  of 0.6 to 1.6 (see page 3, part [0035]). Thus, an amount of  $\text{NH}_3$  being injected to the exhaust gas downstream of the oxidation catalyst in Schafer-Sindlinger is controlled by various means such as a control valve. Therefore, such disclosure by Schafer-Sindlinger is notoriously well known in the art so as to be proper for official notice.

*Claims 6, 8, 9, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schafer-Sindlinger et al. (US Patent Application Publication 2002/0039550) in view of Ohsuga et al. (US Patent 5,357,749).*

Regarding claim 6, Schafer-Sindlinger discloses a system for an exhaust gas system of a diesel internal combustion engine, the system comprising :

an upstream oxidation catalyst (1) for converting a portion of incoming NO into  $\text{NO}_2$  (see Figure 1);

a downstream lean  $\text{NO}_x$  SCR catalyst (2) for converting at least some of said NO and  $\text{NO}_2$  exiting said upstream oxidation catalyst into nitrogen in the presence of a reductant ( $\text{NH}_3$ ),

a reductant injection system ( $\text{NH}_3$ ) coupled upstream of said lean  $\text{NO}_x$  catalyst (2) and downstream of said upstream oxidation catalyst (1) (see Figure 1),

a controller for determining an amount of  $\text{NO}_x$  exiting the upstream oxidation catalyst (see page 3, part [0035]), calculating a ratio of NO to  $\text{NO}_2$  contained in said amount of exiting

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NO<sub>x</sub> (see page 1, part [0010]), and adjusting an amount of reductant to be injected by said reductant system based on said second amount of NO<sub>x</sub> and said ratio (see Figures 4-6, page 3, parts [0035, 0043]); however, fails to disclose that a sensor coupled upstream of said lean NO<sub>x</sub> catalyst. Ohsuga teaches that it is conventional in the art, to utilize a NO<sub>x</sub> sensor (7) coupled upstream of a lean NO<sub>x</sub> catalyst (1) (see Figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Ohsuga in the Schafer-Sindlinger system since the use thereof would have provided a means to determine the NO<sub>x</sub> concentration in the exhaust gas.

Regarding claim 8, Ohsuga further teaches that said sensor is a NO<sub>x</sub> sensor (see col. 3, lines 61-63).

Regarding claim 9, Schafer-Sindlinger further discloses that said reductant includes urea (see page 3, part [0035], lines 17-19).

Regarding claim 23, Schafer-Sindlinger discloses a system for reducing exhaust gas NO<sub>x</sub> of a diesel internal combustion engine, the system comprising:

a fueling system coupled to the engine for providing diesel fuel for combustion;

an upstream oxidation catalyst (1) for converting a first portion of incoming NO into NO<sub>2</sub> in the combustion gas to provide an exiting NO to NO<sub>2</sub> ratio of a 1:1 molar ratio (see page 3, parts [0043, 0044]; and a downstream lean NO<sub>x</sub> SCR catalyst (2) for converting said a second portion of NO and NO<sub>2</sub> exiting said upstream oxidation catalyst in the presence of a reductant (NH<sub>3</sub>); and a controller for determining an amount of reductant to be injected between said upstream and downstream catalyst based on an estimate of an actual NO to NO<sub>2</sub> ratio (see

Figures 4-6, page 3, parts [0035, 0043]); however, fails to specifically disclose that diesel fuel includes sulfur and providing an exiting NO to NO<sub>2</sub> ratio within 50% of a 1:1 molar ratio.

It is well known to those with ordinary skill in the art that diesel fuel includes an amount of sulfur. Therefore, such disclosure by Schafer-Sindlinger is notoriously well known in the art so as to be proper for official notice.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide specific optimum range of NO to NO<sub>2</sub> molar ratio within 50% of a 1:1 molar ratio, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

#### *Allowable Subject Matter*

Claims 11-22 are allowed.

Claims 3-5, 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### *Response to Arguments*

Applicant's arguments filed on 7/19/05 have been fully considered but they are not deemed persuasive.

The Applicant argued that the Schafer-Sindlinger reference fails to disclose calculating an amount of reductant to be injected based on an amount of NO<sub>x</sub> and a ratio of NO to NO<sub>2</sub>

contained in the amount of NO<sub>x</sub> and controlling injected reductant based on said calculated amount of reductant to be injected. The Examiner respectfully disagrees, since the Schafer-Sindlinger reference discloses calculating an amount of reductant to be injected based on an amount of NO<sub>x</sub> and a ratio of NO to NO<sub>2</sub> contained in the amount of NO<sub>x</sub> (see Figures 4-6, page 3, parts [0035, 0043]).

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### *Conclusion*

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:00 a.m.- 6:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number



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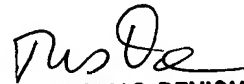
for this group is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).

DT  
September 28, 2005



Diem Tran  
Patent Examiner  
Art unit 3748



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